Benchmark Case Study - Hawaii

(present management system)

Conservation Effects Worksheet

Cropland - Sugarcane

(land use and crop)

Resource Setting: Kauai, Hawaii

Soils - Kapaa silty clay

Rainfall 74 inches

Elevation - 360 feet

Unique situation - field located on ridge top next to stream and Kapaia reservoir is located above the field

Present Management System:

Sugarcane is grown in a monoculture situation. After harvest the field is subsoiled, disced, and harrowed. Planting is done mechanically. This is an unirrigated field. N and P is applied in bands at planting; K is applied by aircraft. Insects are controlled biologically. Herbicides are used to control weeds. Polado is used for ripening. Field is burnt, raked, and sugarcane is hauled to the mill.

Resource Problems Before Treatment:

Erosion is a problem; this is a highly erodible field. The field is close to a reservoir and stream. May have nutrient and herbicide problems.

ACTIONS (Kinds, Amounts, Timing)	**EFFECTS** (Effects of Continuing Bench System)
Field Preparation	
Subsoiling	Increase infiltration Increases moisture conservation Reduces erosion when done cross slope or on contour
Disc and Harrow (40 minutes/acre)	Plow with no regard to lay of the land (Plow up & down hill increases gully erosion) Fuel is approximately 25 gals/acre.
Incorporate 2,000 lbs/ac of calcium metasilicate Sources - Hawaii Cement CaSi03 - Hawaiian Western Steel Slag	Broadcast and incorporate in soil. Once per crop
Planting	
Fertilizer - Urea (46-0-0) is applied as a band at planting - Ammonium phosphate (11-52-0) is applied once as a band at planting	Banding will facilitate minimum amount of fertilizer applied. Placement of fertilizer in direct area of plant is good
Pieces of sugarcane treated with fungicide. (Tilt used at 0.006 gals/acre)	Only tiny amounts used Point source is a potential problem around vats used to dip seed cane pieces
Planting is done using a mechanical planter. One acre is planted in an hour.	Depending on time of planting, may compact soil with planting machine. Labor costs are 1.7 hrs.acre
Plant Maintenance	
Herbicide and fertilizer is applied every 4 to 6 weeks. Fertilizer - Urea (46-0-0) applied as band over line every 4 to 6 weeks with rubber tire tractor or aircraft. Approximately 320 lbs./ac applied.	May drift if applied by aircraft. Tractor may compact soil.

ACTIONS (Kinds, Amounts, Timing)	**EFFECTS** (Effects of Continuing Bench System)
Plant Maintenance	
- Ammonium Phosphate (11-52-0) applied as bands along with seed pieces. Application is once a year. Approximately 200 lbs./ac is applied.	Direct application, minimizes waste of fertilizer
- Potassium Chloride (0-0-61) is applied in bands over line or broadcasted by aircraft every 4 to 6 weeks. Approximately 385 lbs./acre is applied.	Band or broadcast applied.
Herbicides are applied to crop with tractor or aircraft. Chemicals used: - Evik 80W - 5.9 lbs/ac - Aatrex 80W - 5.7 lbs/ac - Aatrex nine-O - 1.9 lbs/ac - Karmex - 6.1 lbs/ac - Dow Pon - 0.3 lbs/ac - DMA-6 - 0.6 gal/ac - RODEO - 0.2 gal/ac - VELPAR - 0.8 lbs/ac - ASULOX - 0.05 gal/ac - OUST - 0.002 lbs/ac	Herbicides may get into water bodies or drift to other areas.
Adjuvants Used at - 0.29 gals/ac - NALOCOTROL - NI-100 - D-FOAM - ACTIVATOR NF	

ACTIONS (Kinds, Amounts, Timing)	**EFFECTS** (Effects of Continuing Bench System)
Pest Management	
Pest Management (595) - Use biological control on insect pests	Good Practice
Rodent Control	
Rodenticides are applied at 20 lbs/ac/crop cycle. They are applied when the sugarcane is: - 9 months old - 12 months old - 18 months Rodinticides used - ZINC PHOSPHIDE - 10 lbs/ac - PIVAL (spot applications) - ?? lbs/ac	Rodenticides getting into the water bodies. Other animals besides the rats eat the rodenticide Other animals eat the poisoned rats
Ripening the Sugarcane	
Growth regulators used - POLADO - 1lb./acre - ETHREL - 1lb./acre	Usually applied by aircraft, may drift into water bodies
Harvesting	
Burn excess dry leaves	Smoke can become a problem
Push rake used to push sugarcane into windrow for easier harvesting	Push soil into wind rows also
Load cane on truck	Destruction of soil structure when heavy trucks come into field
Haul cane to mill	Carries lots of soil to the mill; especially when harvesting during wet weather

Comments:

Ag-chemicals should be closely managed. Current harvesting methods inadvertently moves a tremendous amount of soil from the fields to the mills. Soil is lost on roads, which greatly effect surface water quality. Soil processed at the mill with sugarcane aggravates amounts of point source pollutants discharged.